

2. 010612a, P.I. A.N.7

Robin has 8 blouses, 6 skirts, and 5 scarves.

Which expression can be used to calculate the number of different outfits she can choose, if an outfit consists of a blouse, a skirt, and a scarf?

$$8 \times 6 \times 5 = 240 \text{ possible outfits}$$

12.

080502a, P.I. A.N.7

Cole's Ice Cream Stand serves sixteen different flavors of ice cream, three types of syrup, and seven types of sprinkles. If an ice cream sundae consists of one flavor of ice cream, one type of syrup, and one type of sprinkles, how many different ice cream sundaes can Cole serve?

$$16 \times 3 \times 7 = 336 \text{ possible ways of making a sundae}$$

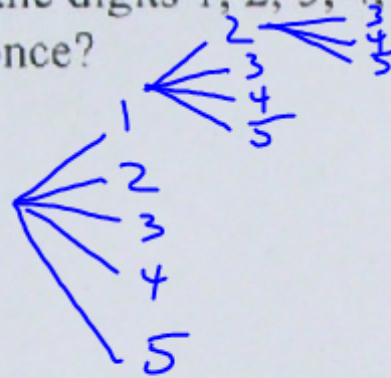
- 1) How many different five-digit numbers can be formed from the digits 1, 2, 3, 4, and 5 if each digit is used only once?

1) 120

2) 60

3) 24

4) 20



$$\underline{5 \times 4 \times 3 \times 2 \times 1 = 120 = 5!}$$

- 2) A locker combination system uses three digits from 0 to 9. How many different three-digit combinations with no digit repeated are possible?

1) 30

2) 504

3) 720

4) 1,000

$$\begin{array}{c} 10 \cdot 9 \cdot 8 = 720 \\ \downarrow \quad \downarrow \quad \downarrow \\ 0-9 \quad 9 \text{ choices} \quad 8 \text{ choices} \end{array}$$

- 12) A certain state is considering changing the arrangement of letters and numbers on its license plates. The two options the state is considering are:
 Option 1: three letters followed by a four-digit number with repetition of both letters and digits allowed

Option 2: four letters followed by a three-digit number without repetition of either letters or digits [Zero may be chosen as the first digit of the number in either option.]

Which option will enable the state to issue more license plates? How many more different license plates will that option yield?

AAA1111

$$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 \cdot 10$$

$$26^3 \cdot 10^4 \approx 176 \text{ mil}$$

ABCD123

$$26 \cdot 26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10$$

$$26 \cdot 25 \cdot 24 \cdot 23 \cdot 10 \cdot 9 \cdot 8$$

$$\approx 360 \text{ mil}$$

$$\approx 260 \text{ mil}$$

13 In Jackson County, Wyoming, license plates are made with two letters (*A* through *Z*) followed by three digits (0 through 9). The plates are made according to the following restrictions:

- the first letter must be *J* or *W*, and the second letter can be any of the 26 letters in the alphabet
- no digit can be repeated

How many different license plates can be made with these restrictions?

A handwritten diagram in blue ink. At the top, a rectangle is divided into five sections by vertical lines. The first section contains the letters 'JA', the second contains '1', the third contains '2', the fourth contains '3', and the fifth is empty. Below the rectangle, there are five vertical tick marks corresponding to the sections. Below the tick marks, the calculation $2 \cdot 26 \cdot 10 \cdot 9 \cdot 8$ is written.

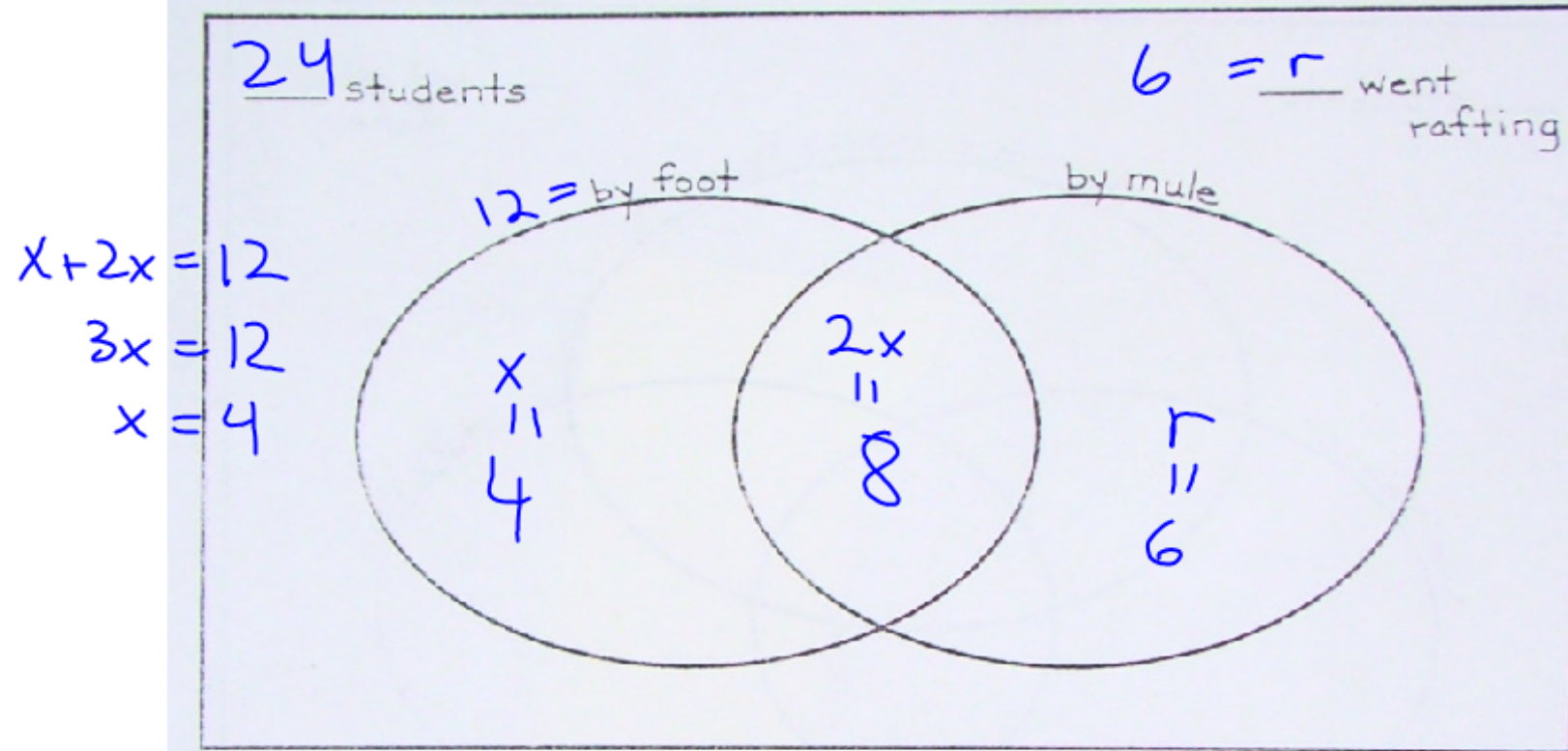
$$2 \cdot 26 \cdot 10 \cdot 9 \cdot 8$$

- 2) All seven-digit telephone numbers in a town begin with 746. How many telephone numbers may be assigned in the town if the last four digits do not begin or end in a zero.

$$\begin{array}{ccccccc}
 \underline{7} & \underline{4} & \underline{6} & - & \underline{1} & \underline{5} & \underline{5} & \underline{1} \\
 / & / & / & & / & / & / & \backslash \\
 1 & \cdot & 1 & \cdot & 1 & \cdot & 9 & \cdot & 10 & \cdot & 10 & \cdot & 9
 \end{array}$$

$$= 8100$$

In Arizona the group of 24 students visited the Grand Canyon. Some spent their time white-water rafting, while the rest went down into the canyon either by foot or by mule or both.



- + • The number who went by both mule and foot was twice the number who went solely by foot.
- The number who went only by mule was the same as the number who went white-water rafting.
- X • The number who went by foot was half the total number.

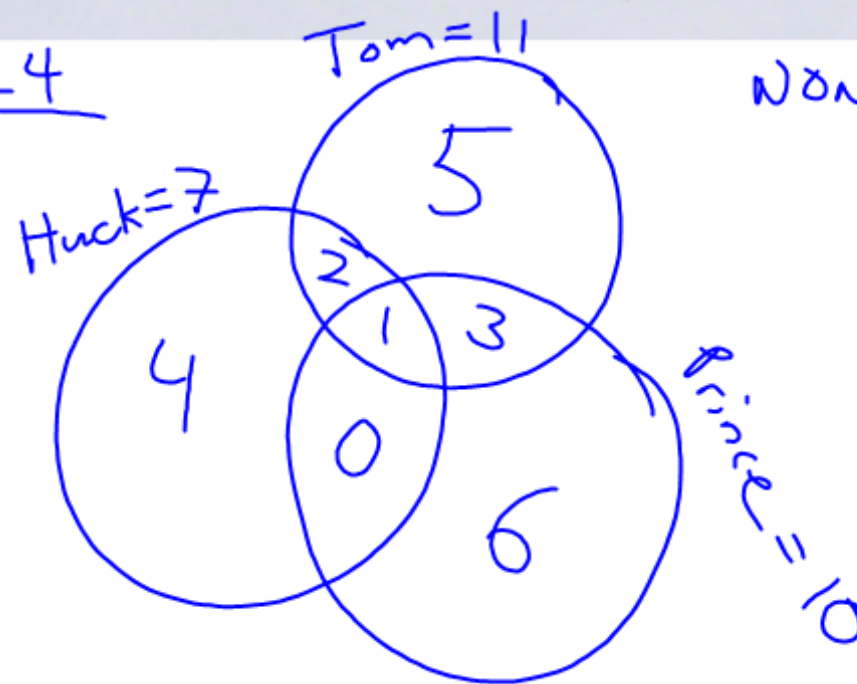
How many went white-water rafting?

In Missouri the group of 24 students visited Hannibal, the home of Mark Twain.

- X • 11 of the students had read Twain's book *The Adventures of Tom Sawyer*.
- X • 7 had read his book *The Adventures of Huckleberry Finn*.
- X • 10 had read his book *The Prince and the Pauper*.
- X • 3 had read both *The Adventures of Huckleberry Finn* and *The Adventures of Tom Sawyer*.
- X • 4 had read both *The Adventures of Tom Sawyer* and *The Prince and the Pauper*.
- X • 1 had read both *The Prince and the Pauper* and *The Adventures of Huckleberry Finn*.
- X • 1 had read all 3 stories.

How many had read none of the 3 books by Twain?

TOTAL 24



NONE $24 - 21 = 3$

3, 9, 11